



## Original Communication

## A profile of fatal snake bite cases in the Bankura district of West Bengal

Saurabh Chattopadhyay MD Assistant professor<sup>a,\*</sup>, Biswajit Sukul MD Associate professor<sup>b</sup><sup>a</sup> Department of Forensic and State Medicine, Bankura Sammilani Medical College, Bankura 722102, West Bengal, India<sup>b</sup> Department of Forensic and State Medicine, N.R.S. Medical College, Kolkata, West Bengal, India

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## ABSTRACT

Deaths due to snake envenomation are considered as a public health problem in rural India. The scenario is no different in Bankura district of West Bengal. 86 cases of deaths due to snake bites were recorded during a three year period from January 2006 to December 2008. Nearly 60% of the victims were in the age group of 21–40 years and males comprised 60.47% of the cases. Majority of the incidences occurred during the monsoons and during day time. The present study also highlights the sociological impact and suggests certain preventive measures to reduce snake bite mortality.

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## 1. Introduction

Incidences of snake bites are common in India. Majority of the cases are reported from the rural areas where it is now considered as a public health problem. As per WHO statistics about 2,500,000 poisonous snake bites are reported annually worldwide of which 1,25,000 are fatal and India accounts for 10,000 deaths per year.<sup>1</sup> In Asia approximately 4 million cases occur in a year and 1,00,000 deaths are reported annually.<sup>1</sup> In Nepal 20,000 snake bites and 1000 deaths occur annually<sup>2</sup> while in Sri Lanka the annual mortality rate from snake envenomation is 6 per 1,00,000 population.<sup>3</sup> The true figures surely surpass the reported number of cases because many of the cases go unreported due to popular traditional methods of treatment. The present study was undertaken to highlight the epidemiological characteristics of fatal snake bite cases in rural West Bengal.

## 2. Material and methods

The present study is a prospective study conducted in the department of Forensic and State Medicine, Bankura Sammilani Medical College, Bankura, West Bengal, India, from January 2006 to December 2008. All the cases of snake bites that were brought for autopsy examination to the department during the three year period were included in the study. A total of 86 cases were recorded

during the said period. Details regarding the cases were obtained from the inquest report, hospital records interviewing the family members and a detailed autopsy examination. The data so obtained were analyzed and presented in the study.

## 3. Results

A total of 86 cases of fatal snake bites were recorded between January 2006 and December 2008. In 2006 and 2007 the number of cases recorded was 25 and 26 respectively whereas in 2008 it was 37.

Individuals in the age group of 21–30 years were the most common victims (33.73%) followed by the age group of 31–40 years (25.59%). Children below the age of 10 years and persons above 60 years comprised only 8.13% of cases. Table 1.

Males were sufferers in 60.47% cases whereas females were affected in 39.53% cases.

Majority of the incidences (83.72%) occurred during the months of June to November, with maximum incidence 17 cases in the month of June. No cases were recorded in the months of December, January and March in the 3 year period. Table 2.

61.63% of the incidences occurred between 6AM and 10 PM with a peak of 24.42% between 12 Noon to 6 PM. A second peak was noted between late night and early morning hours i.e. 10PM to 6 AM (38.37%) Table 3.

Majority of the incidences occurred outdoors (62.80%) with maximum incidence in the field (25.58%) followed by the jungle (16.23%). Among the indoor locations (37.20%) maximum occurred in the room on the floor (34.88%). Table 4.

\* Corresponding author. Tel.: +919433968710.

E-mail address: [chattopadhyaydrs@rediffmail.com](mailto:chattopadhyaydrs@rediffmail.com) (S. Chattopadhyay).

**Table 1**  
Age distribution of the victims.

Age group (years)	Cases	Percentage
Less than 10	6	6.97
10–20	13	18.12
21–30	29	33.73
31–40	22	25.59
41–50	8	9.30
51–60	7	8.13
61–70	1	1.16
Above 70	0	0

**Table 2**  
Month wise distribution of cases.

Month	2006	2007	2008	Total	Percentage
January	0	0	0	0	0
February	0	1	2	3	3.49
March	0	0	0	0	0
April	1	3	2	6	6.97
May	1	2	2	5	5.82
June	2	6	9	17	19.76
July	1	2	5	8	9.30
August	5	1	6	12	13.96
September	7	3	5	15	17.44
October	4	4	4	12	13.96
November	4	2	2	8	9.30
December	0	0	0	0	0

In 31.40% cases the victims survived between 6 and 12 h whereas in 24.41% cases the period of survival was between 3 and 7 days. Early deaths within 3 h of the bite were recorded only in 5 cases (5.82%). Table 5.

The lower limbs (55.81%) were the preferred sites of bite compared to the upper limbs (40.69%). In half of the cases the feet were the site of bite. Table 6.

#### 4. Discussion

A rising trend has been noted in our study. Similar trend has been reported by Panna Lal et al. in their study in JIPMER<sup>4</sup> from 1990–96.

The monsoon season was the period of maximum incidence as found from our study (June to November). Subsequently during the winter months the reptiles go into their hibernation period and hence the incidences are less. Brunda<sup>5</sup> reported maximum bites during June to September while Panna Lal<sup>4</sup> found the highest number of cases from September to November. Similar findings were reported from Brazil in 1988.<sup>6</sup> In the district of Burdwan<sup>7</sup> maximum incidence was recorded in July and August while in Nepal majority of the incidences occurred during the monsoon (August to October) 51%.<sup>8</sup>

Our study showed that the working class people i.e. in the age group of 21–30 years and 31–40 years are mostly affected and majority of them are males. These are the people who work in the field and in the rainy season are the most susceptible victims of snake bite. The sociological impact of such incidence is immense as

**Table 3**  
Time of incidence.

Time	Cases	Percentage
6AM–12 Noon	18	20.94
12Noon–6PM	21	24.42
6PM–10PM	14	16.27
10PM–6AM	33	38.37

**Table 4**  
Place of incidence.

		Cases	Percentage
Indoor	Bedroom	30	34.88
	Store room	2	2.32
	Total	32	37.20
Outdoor	Jungle	14	16.23
	Field	22	25.58
	Courtyard	6	6.98
	Road	1	1.17
	Cowshed	3	3.49
	Garden	2	2.32
	Others	6	6.98
	Total	54	62.80

these groups of people are the earning members and form the work force of the family. Hence death of these individuals affects the total family as they are economically dependent on them. This forms the basis of monetary compensation by the government to the affected family members in such snake bite deaths. Similar findings were reported by Hati et.al.<sup>7</sup> in the neighbouring district of Burdwan 21–30 years, Panna Lal<sup>4</sup> in JIPMER 15–60 years, Brunda and Sashidhar<sup>5</sup> in Andhra Pradesh 21–50 years and in Nepal 10–40 years,<sup>8</sup> Pakistan 15–44 years<sup>9</sup> and Zimbabwe 6–40 years.<sup>10</sup>

Very similar to our study the male preponderance has been well established in all the previous studies from India and abroad – Pakistan<sup>9</sup> and Thailand.<sup>11</sup> Sharma<sup>12</sup> in his study found mean age of the victims to be 32 years and 60% were males.

Majority of the incidences were reported during the day i.e. from 6 AM to 10 PM with a peak between 12 Noon to 6 PM. Most of these incidences occurred outdoors in the field or jungle presumably during working. The male: female victim ratio was 1.3: 1. Sharma<sup>12</sup> in his study found that most of the cases of snake bites occurred outdoors (82%) and agriculture was the dominant profession. Half of the incidences occurred during the day or between 6PM and Midnight. Laloo<sup>16</sup> also reported that most of the incidences occurred during day time. On the other hand 38.37% of the fatalities in our study were reported between late night and early morning hours of 10 PM–6 AM. During this period in the rural areas the people remain asleep and are unaware of the impending danger. The male: female victims during this period were 2:1 and 81% of the incidences during this period occurred within the room on the floor, i.e. when the individuals were sleeping. Sharma<sup>12</sup> found 49% of the victims lived in huts with mud walls. He also reported that bites in the houses occurred during resting and between Midnight and 6 AM. This is due to the fact that in the villages the persons usually sleep on the floor of their houses which are not properly locked. Moreover lack of electricity in most of the villages in this area also is a major problem at night. Snakes are known to enter houses at night in search of food and bite humans sleeping on the floor.<sup>13–15</sup>

Our study revealed that in 31.40% cases the period of survival was between 6 and 12 h and in nearly one fourth (24.41%) cases it was between 3 and 7 days. Thus it is quite clear that in most of the

**Table 5**  
Period of Survival.

Period	Cases	Percentage
Less than 3 h	5	5.82
3–6 h	18	20.93
6–12 h	27	31.40
12 h–1 day	6	6.98
1–3 days	7	8.14
3–7 days	21	24.41
More than 7 days	2	2.32

**Table 6**  
Site of bite.

Site of bite		Cases	Percentage
Lower limbs	Right foot	22	25.58
	Left foot	21	24.41
	Right leg	2	2.32
	Left leg	0	0
	Right thigh	2	2.32
Upper limbs	Left thigh	1	1.17
	Right hand	14	16.27
	Left hand	13	15.12
	Right forearm	2	2.32
	Left forearm	3	3.49
Others	Right arm	1	1.17
	Left arm	2	2.32
	Waist	1	1.17
	Neck	1	1.17
	Lip	1	1.17

cases sufficient time was available for medical treatment in spite of which the victims expired. This was mostly due to delay in hospitalization. The primary reasons leading to delayed hospitalization was that most of the incidences occurred in the odd hours of the night in the rural areas where it was not possible to shift the patients to the hospital at that time due to lack of proper transportation facilities, non availability of ambulance, poor communication system and the distant location of the hospital from the place of incidence. Thus valuable time was lost and the effects of the venom supervened even if anti snake venom was administered. Apart from this quack treatment in some cases also led to loss of time and resulted in fatality. Hansdak<sup>8</sup> reported that 90% of the cases in Nepal presented to the hospital within 3 h whereas in Africa 80% of the victims consult the traditional practitioners before reaching a hospital.<sup>17,18</sup>

The lower limbs were more affected by bites (55.81%). Among the 54 cases reported from outdoor locations 34 bites were on the lower limbs. Many of these victims were working in the field in standing position and their feet were completely exposed as they remain bare footed. Hansdak<sup>8</sup> in his study found 60% of the bites in the lower limbs. Lalloo<sup>16</sup> also reported of similar findings. Bites during the night hours were mostly in indoor locations and was noted in the upper limbs in 14 cases and on the lower limbs in 16 cases. Not much of a difference was noted here as during sleep the hands and the feet were almost equally susceptible for bites.

## 5. Conclusion

Fatalities from snake bites are surely preventable. The primary aim should be to reduce the incidence by taking proper precautionary measures like wearing protective thick, knee high foot wear and avoiding sleeping on the floor. In cases of bites quick transportation facilities should be made available to ensure prompt medical attention. Awareness against quack treatment would also be helpful. On the part of the government instead of a one time monetary compensation, long term measures should be taken (so that the family can overcome the financial hardship) in the form of

providing free ration to the family members, education of the children and medical facilities.

## Conflict of interest

None declared.

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## Ethical approval

Obtained from Institute Ethics Committee.

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